homogeneity, only the first culture set from each patient was analysed, we did consider the results of additional culture sets that had been obtained during the same febrile episode in order to determine the significance of growth.

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Contamination of catheter-drawn blood cultures

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We read with interest the recent article in *CMI* by Eskira *et al*. [1] reporting a change in the rate of blood culture contamination following an educational intervention. The authors concluded that this programme of training, in which a number of instructions for obtaining blood via venepuncture were outlined, significantly reduced the rate of blood culture contamination.

Although most blood samples for culture are obtained via the percutaneous route, blood is often obtained from existing intravascular catheters for reasons such as poor venous access, a requirement for frequent blood sampling, and as an aid to the diagnosis of catheter-related bloodstream infection (CR-BSI) using paired blood cultures. The use of percutaneously acquired blood samples has been demonstrated to be more sensitive for the diagnosis of bacteraemia in comparison with catheter-drawn specimens [2,3]. Catheter-drawn blood cultures may be positive because of true bacteraemia, catheter colonisation or catheter contamination, with the latter being responsible for this reduced sensitivity.

The main routes of entry for microorganisms implicated in CR-BSI have been outlined previously [4], and include intra-luminal migration of microorganisms from the hub. Indeed, microbial colonisation of the catheter hub has been described as the initial step in the pathogenesis of CR-BSI acquired via the intra-luminal route, and is responsible for the highest proportion of CR-BSI in patients with long-term central venous catheters [4,5]. A previous study has demonstrated that 22% of stopcock entry ports and 31% of arterial line hubs were contaminated with microorganisms after 72 h *in situ*, although none of the study patients exhibited clinical evidence of CR-BSI [6]. This highlights the potential of the hub as a source for microbial contamination of catheter-drawn blood samples.

Skin antisepsis used before venepuncture in order to reduce the risk of blood culture contamination has been investigated widely in comparison with research into the prevention of catheter-drawn blood sample contamination. This may, in part, be a consequence of a general discouragement of using catheter-drawn blood for culture because of its reduced sensitivity in aiding the diagnosis of true bacteraemia, and the possibility of increasing the chance of microbial colonisation within the catheter lumen following increased fibrin deposition.

Several strategies to reduce microbial contamination of catheter hubs have been developed. These include the development of a highly porous cleaning swab to remove microorganisms from access ports, frequent heating of metallic hubs, the application of disinfectants, and the use of needle-less connectors [6,7]. With the exception of the application of disinfectants, none of these methods has, to date, been implemented widely in the clinical setting. A previous study [7] demonstrated that chlorhexidine gluconate 0.5% w/v in isopropyl alcohol 70% v/v was more efficacious than isopropyl alcohol 70% v/v or aqueous povidone-iodine 10% w/v for the decontamination of intravenous connections. This is consistent with the recommendation by Eskira *et al*. [1] for disinfection of skin and bottle injection ports. Another potential method of reducing the risk of contamination is to replace access ports immediately before blood samples are drawn from the catheter.

Once contaminating microorganisms have migrated to and colonised a catheter's intra-luminal surface, other methods of reducing the risk of false-positive blood culture results from this source are required. It has been recommended that 6–10 mL blood is withdrawn and discarded before a blood sample via an intravascular catheter is obtained from adult patients. The rationale for this is to remove any intra-luminal fluids from the catheter's dead space, as some fluids may inhibit the growth of microorganisms in blood cultures, or may dilute the optimal volume of blood required for culture [8]. Another advantage of withdrawing and discarding the first 6–10 mL of blood is that any microorganisms present in the lumen of the catheter, particularly those not attached to the catheter surface, can be removed. The volume of blood to be withdrawn and discarded should be assessed according to the patient's characteristics, including age and type of catheter *in situ*. It is not evident from the literature whether this practice has been adopted widely, but it would seem to be a logical approach, particularly in view of the poor sensitivity record of this method [2,3]. Further investigations are needed to confirm the value of removing and discarding blood from the catheter before blood samples are collected.

In conclusion, because of the high additional costs of blood culture contamination [1], we recommend that, if it is necessary to obtain blood samples for culture via a catheter, strategies for the prevention of contamination of these samples should be clearly defined and employed. These strategies may include the use of needle-less connectors, appropriate disinfection or replacement of access ports, and the discarding of a volume of blood before sampling for blood culture.

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The specificity of the electroimmunotransfer blot assay for *Taenia solium* cysticercosis

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The recent article in *CMI* by Furrows *et al*. [1] pointed out the lack of specificity of a single positive 50-kDa band in the electroimmunotransfer blot assay for cysticercosis. Until now, such a test has been considered to be 100% specific for the diagnosis of *Taenia solium* cysticercosis. It is accepted that only *T. solium* causes human cysticercosis and not *Taenia saginata*. However, there is a third human taeniid, *Taenia asiatica*, first described in 1993 [2], for which the definitive geographical distribution is still unknown. Some specialists discount *T. asiatica* as a possible cause of human cysticercosis because of its molecular similarities with *T. saginata* [3], while others consider that *T. asiatica* should be a candidate for human cysticercosis until there is evidence to the contrary [4]. At the present time, the possibility that *T. asiatica* could also cause human cysticercosis is certainly significant.

In this respect, Furrows *et al*. [1] reported that two of the apparently non-cysticercotic patients showing positive bands in the electroimmunotransfer blot assay were parasitised by adult tapeworms. Specifically, one patient harboured *T. saginata*, and the electroimmunotransfer blot assay yielded two positive bands. The authors do not specify the patient's geographical origin, or the diagnostic procedure employed to identify the